CLAIMS

What is claimed is:

1. A failure prediction system comprising:

multiple devices; and

a device management server managing the multiple devices via a network;

wherein each of the multiple devices includes a device diagnosis section for diagnosing a state of the device to send first diagnosis results obtained by the diagnosis to the device management server; and

the device management server includes a failure prediction section for recognizing a state related to a failure based on the first diagnosis results sent by the device diagnosis section of each of the devices, performing diagnosis as for the recognized state related to a failure, and predicting a device with a failure tendency based on second diagnosis results obtained by the diagnosis.

2. A failure prediction system comprising:

multiple devices; and

a device management server managing the multiple devices via a network;

wherein each of the multiple devices includes a device diagnosis section for diagnosing a state of the device with a first diagnosis program sent by the device management server to send first diagnosis results obtained by the diagnosis to the device management server; and

the device management server includes a failure prediction section for recognizing a state related to a failure based on the first diagnosis results sent by the device diagnosis section of each of the devices, sending a second diagnosis program for performing diagnosis as for the recognized state related to a failure, to devices to be diagnosed as for the state related to a failure among the devices, and predicting a device with a failure tendency based on second diagnosis results notified by the second diagnosis program.

3. The failure prediction system according to claim 1 wherein the device diagnosis section of the device comprises: a communication part for communicating with the device management server;

a program execution part for executing first and second diagnosis programs for diagnosing the state of each part of the device;

a storage part for preserving settings of the first and second diagnosis programs and the first and second diagnosis results; and

a detection part for detecting the state of each part of the device.

4. The failure prediction system according to claim 1 wherein the failure prediction section of the device management server comprises:

a communication part for communicating with the device;

a data processing part for creating failure occurrence tendency information showing a tendency of a state related to a failure based on the first diagnosis results sent by each of the devices and creating the second diagnosis program;

a storage part for storing the information on the device and the diagnosis results; and

a search part for searching for a device corresponding to the failure occurrence tendency information.

5.   The failure prediction system according to claim 1 wherein each of the devices comprises an operation restriction section for restricting a part or all of operations of the device in response to a signal from the device management server.

6.   The failure prediction system according to claim 1 wherein each of the devices comprises a warning section for giving a warning that at least one of a failure of the device is predicted and operations are restricted, in response to a signal from the device management server.

7.   The failure prediction system according to claim 1 wherein the device comprises a printer.

8.   The failure prediction system according to claim 1 wherein the diagnosis by each of the devices of the state of the device is periodically performed.

9. The failure prediction system according to claim 1 wherein the diagnosis by each of the devices of the state of the device is performed when an event occurs.

10. The failure prediction system according to claim 1 wherein the notification by each of the devices of the results of diagnosis of the state of the device to the device management server is periodically performed.

11. The failure prediction system according to claim 1 wherein the detection of a state related to a failure by the failure prediction section of the device management server is performed based on a process leading to a failure of the device.

12. A device to be managed by a device management server via a network, the device comprising:

a device diagnosis section for diagnosing a state of the device to notify the device management server of diagnosis results obtained by the diagnosis via the network.

13. The device according to claim 12, wherein the device further comprises an operation restriction section for restricting operations of the device in response to a signal from the device management server.

14. The device according to claim 12, wherein the device further comprises a warning section for giving a warning to the effect that at least one of a failure of the device is predicted and operations are restricted, in response to a signal from the device management server.

15. A printer to be managed by a device management server via a network, the printer comprising:

a device diagnosis section for diagnosing a state of the printer to notify the device management server of diagnosis results obtained by the diagnosis via the network.

16. A device management server for managing multiple devices via a network, the device management server comprising:

a failure prediction section for recognizing a state related to a failure based on diagnosis results obtained by diagnosis and sent by each of the devices, performing diagnosis as for the recognized state related to a failure, and predicting a device with a failure tendency based on diagnosis results obtained by the diagnosis.

17. A failure prediction program for realizing a failure prediction system comprising:

multiple devices; and

a device management server for managing the multiple devices via a network with a computer;

wherein each of the multiple devices includes a device diagnosis section for diagnosing a state of the device to send first diagnosis results obtained by the diagnosis to the device management server; and

the device management server includes a failure prediction section for recognizing a state related to a failure based on the first diagnosis results sent by the device diagnosis section of each of the devices, performing diagnosis as for the recognized state related to a failure, and predicting a device with a failure tendency based on second diagnosis results obtained by the diagnosis.

18. A failure prediction program for realizing a failure prediction system comprising:

multiple devices; and

a device management server for managing the multiple devices via a network with a computer;

wherein each of the multiple devices includes a device diagnosis section for diagnosing a state of the device with a first diagnosis program sent by the device management server to send first diagnosis results obtained by the diagnosis to the device management server; and

the device management server includes a failure prediction section for recognizing a state related to a failure based on the diagnosis results sent by the device diagnosis section of each of the devices, sending a second diagnosis program for performing diagnosis as for the recognized state

related to a failure to each of the devices, and predicting a device with a failure tendency based on diagnosis results notified by the second diagnosis program.

19. The failure prediction program according to claim 17; wherein the device diagnosis section of the device comprises: a communication part for communicating with the device management server;

a program execution part for executing a diagnosis program for diagnosing the state of each part of the device;

a storage part for preserving settings of the diagnosis program and the first diagnosis results; and

a detection part for detecting the state of each part of the device.

20. The failure prediction program according to claim 17 wherein the failure prediction section of the device management server comprises:

a communication part for communicating with the device;

a data processing part for creating failure occurrence tendency information based on the diagnosis results sent by each of the devices and creating the second diagnosis program;

a storage part for storing the information on the device and the diagnosis results; and

a search part for searching for a device corresponding to the failure occurrence tendency information.

21. A failure prediction method comprising:

diagnosing the state of multiple devices connected to a network;

recognizing a state related to a failure based on results of the diagnosis of the multiple devices;

performing diagnosis as for the state related to a failure; and

predicting a device with a failure tendency based on the diagnosis results.

22. A failure prediction method comprising:

diagnosing the state of multiple devices connected to a network with a first failure diagnosis program provided in each of the devices;

recognizing a state related to a failure based on results of diagnosis by each first failure diagnosis program;

sending to each of the devices a second diagnosis program for performing diagnosis as for the state related to a failure; and

predicting a device with a failure tendency based on diagnosis results notified by the second failure diagnosis program.

23. The failure prediction method according to claim 21 wherein when a device with a failure tendency is predicted, at least one of the following occurs:

operations of the device with a failure tendency are stopped; and

a warning is given to the user of the device after the prediction.

24. The failure prediction method according to claim 21 wherein the diagnosis by each of the devices of the state of the device is periodically performed.

25. The failure prediction method according to claim 21 wherein the diagnosis by each of the devices of the state of the device is performed when an event occurs.

26. The failure prediction method according to claim 21 wherein the notification by each of the devices of the results of diagnosis of the state of the device is periodically performed.

27. The failure prediction method according to claim 21 wherein the detection of a state related to a failure by the failure prediction section of the device management server is performed based on a process leading to a failure of the device.